NOTES ON THE MOSSES OF NEW SOUTH WALES. I.

Additional Records and Description of a New Species of Buxbaumia.

By Alan Burges, B.Sc., Science Research Scholar in Botany,
University of Sydney.

[Read 27th July, 1932.]

Introduction.

A student of Bryology in New South Wales meets at the beginning of his studies with an almost insurmountable obstacle. No complete list is available of the species previously recorded, and many of the records are not in print at all.

Till the beginning of this century the classification of specimens collected was a hopeless task for all but the specialist. Some idea of the difficulties encountered may be gained by reading the preface of the Census Muscorum Australiensium by Watts and Whitelegge, published as supplements to the Proceedings of this Society. Part I appeared in 1902 and the second part three years later. As the result of this and the subsequent publications of Watts and Brotherus, the problems concerning the distribution and taxonomy of the New South Wales mosses have been simplified.

In the years between 1900 and 1917 the late Rev. W. W. Watts was an assiduous collector, and he gradually accumulated a great wealth of data on the occurrence and distribution of the various species. Among the mosses he collected were many which were new to New South Wales, and some new to science. At the time of his death Mr. Watts had started to arrange his notes and observations with the intention of writing a census which would form a supplement to the "Census of New South Wales Plants", published by Maiden and Betche in 1916.

Several years ago, when I became interested in the mosses, Mr. Cheel, the Curator of the National Herbarium, Botanic Gardens, Sydney, suggested to me that I should finish the census begun by Mr. Watts. This has now been done. Conditions at present, however, do not permit of the publishing of the whole work and it has been decided to bring out a series of short papers which will provide a list of the new records and thus bring the 1902-1905 census up to date.

A complete list of the Sphagnaceae will be found in a paper published by Watts (1912), as no new additional species have been found since that time. There have been no new records of the Andreaceae since the 1902-5 census.

The following lists have been arranged according to the scheme of classification adopted by Brotherus in Engler and Prantl, 1924, except that the species have been placed in alphabetical order.

Sub-Class Bryales.
Order group Eubryinales.
Order Fissidentales.

Fissidentaceae.
Fissidens.

F. aristatus Broth., (A)*.—Manly (type; Watts).
F. bascilaris Hpe. et C.M., Linn.* 1853.—Armidale (Watts).
F. brevifolius H.f.W., Fl. N.Z.—Warrumbungle Ranges (Forsyth).
F. bryoidioides Broth., (A).—Penshurst (Cheel; type).
F. chloroloma Broth.—Brunswick River (Watts; type).
F. elamellus C.M. et Hpe., Linn. 1856.—Near Young, frequent (Watts).
F. Forsythii Broth., (A).—Barber's Creek, South Coast (Forsyth, 1899; type).
F. humilis Dix. et Watts, (A).—Newcastle (Burgess, 1910; type).
F. leptocladus C.M., Gen. M., p. 59.—Yarrangobilly (Watts, 1906).
F. oblongifolius H.f.W., *Lond. Journ. Bot.*, 1844.—Cook's River (A. A. Hamilton).
F. perangustus Broth.—Manly (Watts; type).
F. praemollis Broth.—Richmond River (Watts, 1901; type).
F. ridigusculus Broth., (A).—Moss Vale (Forsyth).
var. *leptocladus*, Broth., *l.c.*
F. sordide-virens Broth., (A).—Cambewarra (Forsyth, 1901; type).
F. vittatus H.f.W., Fl. Tas.—Young (Watts).
F. Warningensis Broth.—Mt. Warning (Forsyth, 1900; type).

Order Dicranales.
Ditrichaceae.
Pleuridium.

P. austrosubulatum Broth.; Roth., Auss. Eur. Laub., I, 2, p. 3, Tx. 5.—Rose Bay, Sydney (Forsyth; type).
P. gracilentum Mitt., Linn. 1860.—Young, Gladesville, etc. (Watts).

Ditrichum.

D. strictum H.f.W., Fl. Ant., ii, p. 404.—Blue Mts. (Watts, 1903).

Distichium.

D. capillaceum (Sw.), Br. Eur.—Yarrangobilly (Watts, 1906).

Dicranaceae.
Trematodontoideae.
Trematodon.

T. pygmaeus Broth., in Litt., 1911.—Mt. Kosciusko (Forsyth, Jan., 1899; type).

Campylopodioideae.
Campylopus.

C. denticuspis Broth., (A).—Richmond River (Watts, 1901; type).

---

* See list of contractions and references, p. 242.

DICRANOIDEAE.

DICHODONTIUM.

D. Wattsii Broth. (1912).—Yarrangobilly (Watts, 1896; type).

DICRANOLOMA.

D. Sullivani (C. M. Hedwig, 1897, p. 360).—Yarrangobilly (Watts, 1906).

Order POTTIALES.

POTTIACEAE.

TRICHOSTOMEAE.

TRACHYCARPIDIUM.

T. Novae-Valesiae Broth.; Roth., Auss. Eur. Laub.—Young (Watts; type).

ASTOMUM.

A. Wattsii Broth.; Roth., Auss. Eur. Laub.—Wyong (Watts; type).

HYMENOSTOMUM.

H. inflexum (Tayl.) Broth., Hpe. et C.M., Linn. 1853.—Parramatta (Woolls).
H. robustum Broth.—Fitzroy Falls (Forsyth, 1900; type).
H. Sullivani C.M., Gen. Musc.—Young and Armidale (Watts).

WEISSIA.

W. glauca Broth.—Barber's Creek (Forsyth, 1899; type).

TRIQUETRELLA.

T. albicuspes Broth.—Cowra, Yarrangobilly, etc. (Watts; type and co-types).

TRIDONTIUM.

T. Tasmanicum H.f.W., Hook fil., Fl. N.Z.—Yarrangobilly (Watts).

DIDYMODON.

D. Wildii (Broth.).—Narrabri (Musson).

BARBULA.

B. acrophylla C.M. Symb.—Nowra, Young, Tumut (Watts).
B. amoena C.M. Symb.—Young (Watts).
B. australasiae (Hook. et Grev.) Brid., C.M. Syn., i, 618.—Young, Armidale (Watts).
B. aristatula C.M.; *Pyramitrium*, Mitt. Cat.—Blue Mts. (Mrs. Calvert).
B. glaucula Broth.—Nowra (Watts, 1903; type).

ACAULON.

A. crassinerium Broth.—Cootamundra (Watts; type).
A. robustum Broth.; Roth., Auss. Eur. Laub.—Young (Watts; type).

CALYPTOPOGON.

C. Mniodes (Schwgr.) Mitt., Linn. 1859.—Mt. Wilson (Watts, 1911).

POTTIA.

P. brevicaulis (Tayl., *Lond. Journ. Bot.*, 1846) C.M.—Young.

CROSSIDIUM.

C. Geheebii Broth.—Cobar (Bauerlen, 1903).

ALOINA.

A. Sullivaniana (C. M. Hedwig, 1898) Broth.—Warrumbungle Ranges (Forsyth).

TORTULA.

T. acuminata Broth.—Waverley (type), Nowra (Watts).
T. asperifolia (C.M.) Broth.—Macleay River (Crawford).
T. brunnea Broth. et Watts (1912).—Yarrangobilly (Watts, 1906; type).
T. Baileyi Broth., C.M., 1890. No. 10.—Sydney, Nowra, etc.
T. calodictyon Broth.—Nowra (Watts; type).
T. crassinervis (Tayl.) Mitt., Linn. 1860.—Young (Watts).
T. evanescens Broth., (A).—Young (Watts; type).
T. Readeri (C.M. Symb., No. 190) Broth.—Warrumbungle Ranges (Forsyth).
T. vesiculosa (C.M. Symb., No. 185 as *Barbula*).—Frequent near Sydney.

Contractions and References.

BROTHERUS AND WATTS, 1912.—The Mosses of the Yarrangobilly Caves District. PROC. LINN. SOC. N.S.W., 1912, p. 363.
(A). ————, 1916.—Some New Species of Australian and New Zealand Mosses, IV. PROC. LINN. SOC. N.S.W., 1916.
C.M. Syn.—Synopsis Muscorum. Mueller. 1849-51.
C.M. Symb.—Symbolae ad Bryologicum Australiae, Hedwigia, 1897-8.
Fl. Ant.—Hooker's Flora Antarctica.
Fl. N.Z.—Hooker's Flora of New Zealand.
Fl. Tas.—Hooker's Flora of Tasmania.
Linn.—Proc. Linn. Soc. London.
WATTS, 1912.—The Sphagna of Australia and Tasmania. PROC. LINN. SOC. N.S.W., 1912.
WATTS AND WHITELEGGE, 1902.—Census Muscorum Australiensium. Part i. Supp. to PROC. LINN. SOC. N.S.W., 1902.
————, 1905.—*Id.*, Pt. ii. PROC. LINN. SOC. N.S.W., 1905.

BUXBAUMIA COLYERAE, n. sp.

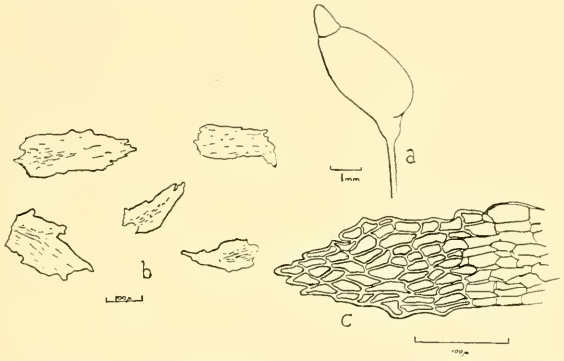
This new species of *Buxbaumia* is of considerable interest because it is the first record of this Order of Mosses from the Australian continent, and because it throws some interesting light on the little known Tasmanian species which it closely resembles, but from which it differs specifically.

Previously an interesting problem of distribution had presented itself. *Buxbaumia indusiata* is well scattered in Europe and Asia, and the finding of what was apparently a closely related species in Tasmania naturally raised the question of its occurrence on the mainland. For nearly a century, however, this remained unanswered, but during a collecting trip to the North Coast Brush of New South Wales, I was so fortunate as to secure specimens of the species.

Plantis sexis reductis; foliis 10–20, parvissimis; 0·2–0·3 mm. longis; lanceolatis vel bi- vel trifidis, rufis, non ciliatis necque pilosis; cellulis grandis 15–45 μ inaequalis, prosenchymatis, in margine emenentibus. Seta c. 1·5–2·5 cm. alta, rufa nitida plana splendida. Theca suberecta ovata superficie superiore planiuscula immarginata, inferiore convexa, operculo conico. Sporis subglobosis, 6–8 μ; muris echinulatis subtiliter.

Gametophyte greatly reduced, leaves minute, just visible to the naked eye, lanceolate to occasionally slightly bi- or trifid, red-brown in colour, varying in

number from 10–20; cells irregular, large, devoid of chlorophyll, margin irregular due to slightly projecting cells, leaves quite devoid of any hairs or cilia. The base of the plant a mass of matted rhizoids interspersed with fungal hyphae, seta bright red, smooth, shiny, about 1·5–2·5 cm. Capsule flattened above, lower surface gibbous, operculum conical. Towards maturity the columella appears to break down somewhat. The peristome is probably composed of smooth bladdery cells as in *Buxbaumia tasmanica*, but no very old capsules were available so this feature must remain in doubt. In the capsules sectioned no noticeable thickening was present, although in other respects the capsules appeared to be matured. Spores brown in the mass, ovoid, 6–8 μ; wall finely echinulate.



Text-fig. 1.—*Buxbaumia Colyerae*, n. sp. (*a*) capsule; (*b*) leaves; (*c*) single leaf enlarged.

It differs from *Buxbaumia tasmanica* mainly in the leaf structure. *Buxbaumia Colyerae* has leaves entirely devoid of cilia or hairs, these being features of the leaves of *Buxbaumia tasmanica*.

The systematic position of this species is almost certainly in the *indusiata* group (see Brotherus, Engler and Prantl). Although a careful examination of microtome sections and whole capsules failed to reveal stomata, it is considered that its general resemblance to *Buxbaumia indusiata* justifies its inclusion there, till a larger quantity of material is available for examination.

The specimens were collected at Williams River in the dense brush at the base of Barrington Tops in September, 1930. The plants were growing amongst the soil formed from a decomposing olivine-basalt, and had been caught in the roots of an upturned tree. In all, twelve capsules were seen and, although a careful search was made in the surrounding area, no further specimens were found. In August, 1931, I again visited the area and, although a week was spent in the district, no trace of the moss was seen. The same log was examined and the soil brought back to the laboratory in the hope of finding gametophytes. This was unsuccessful.

The genus to which this species belongs possesses an almost world-wide distribution but is comparatively seldom seen. This is probably accounted for by the smallness of the gametophyte, the plant only becoming noticeable when in fruit.

Buxbaumia indusiata and *Buxbaumia aphylla* are scattered sparsely throughout Europe and North America. In Asia the former has been found in Central China and the latter in Siberia. Of the other four species *Buxbaumia Piperi* Best.,

comes from Washington (U.S.A.), *Buxbaumia Javanica* C. Muell., from Java, *Buxbaumia tasmanica* Mitt., from Tasmania, and *Buxbaumia Minakatae* Sh. has been described from Japan.

Buxbaumia tasmanica is almost unknown. It was found by Mr. Archer at Chestnut, Tasmania, about 1850, and described by Mitten (*Journ. Linn. Soc. London*, 1860). Mr. Rodway, Government Botanist, Tasmania, informs me that not one capsule is available in any collection known to him. Apparently all that is left are the drawings which are in the possession of the New York Botanical Gardens, and the published description. The new species now described was at first thought to be identical with *Buxbaumia tasmanica*, but has been separated from it. It is named in honour of Miss G. Colyer, who discovered the material.

I desire to thank Mr. Rodway for his kindness in supplying the information about *Buxbaumia tasmanica*; Dr. Darnell-Smith, Director of the Botanic Gardens, Sydney, and Mr. Cheel, Curator of the National Herbarium, Botanic Gardens, Sydney, for granting free access to the records and collection of mosses under their charge; and Professor T. G. B. Osborn for the facilities made available in the Department of Botany, University of Sydney.